

Application Notes

LF4 – CUBE

— Remove Contamination High Vacuum Station —

LF4 – CUBE: Lighting-Field System



Remove contamination for sample and holder shaft
Not recontamination during observation
High vacuum holder station under $< 1 \times 10^{-4}$ Pa

High Vacuum × Light annealing
Remove contamination

You can keep good condition your specimen holder.

Light annealing system



A plasma cleaner cannot remove contamination over the entire holder surface, though it is effective for cleaning just the sample. That is, a plasma cleaner cannot perfectly clean the holder; the sample would be re-contaminated by residue materials from the holder shaft when observed by TEM.

Important points

1. All surfaces of both the holder and sample need cleaning.
2. Plasma damages the sample.

The LF4 system can clean both your sample and the entire holder surface under light and high vacuum without any sputtering damage. This improves your TEM and STEM data.

Our original design : Skewer valve

Attainment of Cryo temperature is impact of cryo dewar vacuum level.



■ Following features and functions made available.

- Slow leak possible. Skewer valve to use for speeding down. It is reduce waiting leak time.
- Supports N2 gas leak, may be connected to this valve.
- To be used as port when pumping Cryo holder dewar.
(located near turbo pump to maximize pumping efficiency).

Comparison remove contamination LF4 And other Plasma Cleaner

- Even if only samples are cleaned, contamination will not go away.
- It is necessary to keep not only the sample but also the holder shaft clean any time.
- No matter what kind of low temperature plasma is used, there is no damage to the sample due to plasma.



Need LF4

Blue:merit Red:demerit

	LF4	Plasma Cleaner 1	Plasma Cleaner 2
Cleaning method	High vac. with lighting anneal	Low temp. Plasma (H2/O2)	Plasma (Ar/O2)
Sample damage	No damage	Yes by plasma	Yes by plasma
Remove Amorphous layer	NO	Yes, Characteristics of plasma cleaner	Yes, Characteristics of plasma cleaner
Cleanable sample	All sample (w/o Frozen sample)	Those less influenced by plasma	Those less influenced by plasma
Cleaning area	All (sample and <u>holder shaft</u>) Holder shaft cleaning is very important	Just sample area	Just sample area
Contamination	Nothing for any time	Recontamination <u>from holder shaft</u> with in 2~3 h	Recontamination <u>from holder shaft</u> with in 2~3 h
Direct Vacuum port	4ports(if use additional port 8 ports) It can also be used as a vacuum station	Max 2port	1 port
Ultimate vacuum	1X10 ⁻⁴ Pa (spec : <5X10 ⁻⁴ Pa)	Max 6.6X10 ⁻⁴ Pa	Not high vacuum mode
Cryo Dewar vacuum	Can be vacuuming Dewar under the high vacuum⇒increasing cooling ability	No	No good vacuum
Cleaning time	1~2h	With in 3min	With in 3min

